CLAIMS:

1. A method for producing a family of discretely and uniformly sized elemental silicon nanoparticles, the family including a plurality of discretely and uniformly sized nanoparticles selected from the group of 1, 1.67, 2.15, 2.9, and 3.7 nanometer nanoparticles, the method comprising steps of:

gradually advancing a silicon anode into an HF acid H_20_2 etchant solution;

creating a moderate to low electrical current density to the silicon anode as it is gradually advanced and to a cathode in electrical contact with the etchant solution;

separating the silicon anode from the etchant solution; and

immersing the anode in dilute HF to weaken linkages of nanoparticles other than 1nm nanoparticles formed on the anode;

separating the family of discretely sized silicon nanoparticles from the silicon anode.

2. The method according to claim 1, wherein said step of separating the family of discretely sized silicon nanoparticles comprises:

subjecting the silicon anode to force to separate silicon nanoparticles from the silicon anode.

3. The method according to claim 2, wherein the force in said step of subjecting is provided by ultrasound waves.

4. The method according to claim 1, wherein said step of separating the family of discretely sized silicon nanoparticles comprises:

placing the silicon anode in a solvent and subjecting the silicon anode to force to separate silicon nanoparticles from the silicon anode.

5. The method according to claim 1, wherein said step of gradually advancing immerses the silicon anode at a rate of about one millimeter per hour.

6. The method according to claim 1, wherein the cathode is formed from platinum, the silicon anode comprises a single crystalline silicon wafer, and the etchant solution comprises HF acid, H_2O_2 and methanol.

7. The method according to claim 6, wherein the silicon wafer comprises p-type boron-doped silicon.

8. The method according to claim 1, further comprising steps for isolating a desired size of silicon nanoparticles from the family, the steps for isolating comprising:

with a colloid of the family of particles obtained after said step of separating, centrifuging the colloid of the family of particles; and

obtaining a residue of silicon nanoparticles from the step of centrifuging, and a solution;

obtaining a desired size of nanoparticle from one of the residue and solution.

9. The method according to claim 8, the steps for isolating further comprising chromatography to further isolated a desired size of nanoparticle.

10. The method according to claim 1, wherein the moderate to low current density within a range of about 5-10 mA/cm^2

11. The method according to claim 1, wherein the moderate or low current density is less than about 10 mA/cm^2.

12. The method according to claim 1, further comprising a 1nm nanoparticle separation step, conducted prior to said step of immersing the anode.

13. Elemental silicon formed into a family of discretely and uniformly sized elemental silicon nanoparticles, the family including 1, 1.67, 2.15, 2.9, and 3.7 nanometer nanoparticles.